

REMARKS

The Official Action mailed October 5, 2006, has been received and its contents carefully noted. This response is filed within three months of the mailing date of the Official Action and therefore is believed to be timely without extension of time. Accordingly, the Applicant respectfully submits that this response is being timely filed.

The Applicant notes with appreciation the consideration of the Information Disclosure Statements filed on November 14, 2003; January 22, 2004; September 9, 2005; and February 14, 2006.

A further Information Disclosure Statement is submitted herewith and consideration of this Information Disclosure Statement is respectfully requested.

Claims 1-21 were pending in the present application prior to the above amendment. New dependent claims 26-32 have been added to recite additional protection to which the Applicant is entitled. Accordingly, claims 1-21 and 26-32 are now pending in the present application, of which claims 1, 3, 5, 8, 11, 14 and 18 are independent. For the reasons set forth in detail below, all claims are believed to be in condition for allowance. Favorable reconsideration is requested.

Initially, it is noted that page 2 of the Official Action appears to inadvertently refer to "35 U.S.C. 102(b)"; however, for all intents and purposes, it appears that the Official Action is basing the rejections on 35 U.S.C. § 103. Also, it is noted that the inventor's name in JP '433 is Kensaku Yano, that is, the inventor's surname is Yano; however, in the present response, the Applicant will refer to JP '433 as "Kensaku," which is consistent with the Official Action. Appropriate correction is respectfully requested.

The Official Action rejects claims 1-21 as obvious based on the combination of JP 11-204433 to Kensaku, U.S. Patent Application Publication No. 2003/0031214 to Tanaka, U.S. Patent No. 6,642,091 to Tanabe and U.S. Patent No. 5,925,410 to Akram, either alone or in combination with one or more of the following: U.S. Patent No. 5,432,122 to Chae, U.S. Patent No. 5,147,826 to Liu and U.S. Patent No. 6,027,960 to

Kusumoto. The Applicant respectfully traverses the rejection because the Official Action has not made a *prima facie* case of obviousness.

As stated in MPEP §§ 2142-2143.01, to establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. Obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either explicitly or implicitly in the references themselves or in the knowledge generally available to one of ordinary skill in the art. "The test for an implicit showing is what the combined teachings, knowledge of one of ordinary skill in the art, and the nature of the problem to be solved as a whole would have suggested to those of ordinary skill in the art." In re Kotzab, 217 F.3d 1365, 1370, 55 USPQ2d 1313, 1317 (Fed. Cir. 2000). See also In re Fine, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988); In re Jones, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992).

The independent claims recite that ultrasonic vibration is applied to the substrate through a chuck during irradiating the laser beam, and that the substrate is floated by the chuck holding an end portion of the substrate during irradiating the laser beam. The present inventors have found that ultrasonic vibration can be applied to a substrate efficiently if applying the ultrasonic vibration to the substrate while floating the substrate.

There is no suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify Kensaku, Tanaka, Tanabe, Akram, Chae, Liu and Kusumoto or to combine reference teachings to achieve the claimed invention. MPEP § 2142 states that the examiner bears the initial burden of factually supporting any *prima facie* conclusion of obviousness. It is

respectfully submitted that the Official Action has failed to carry this burden. While the Official Action relies on various teachings of the cited prior art to disclose aspects of the claimed invention and asserts that these aspects could be used together, it is submitted that the Official Action does not adequately set forth why one of skill in the art would combine the references to achieve the features of the present invention.

The test for obviousness is not whether the references “could have been” combined or modified as asserted in the Official Action, but rather whether the references should have been. As noted in MPEP § 2143.01, “The mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination.” In re Mills, 916 F.2d 680, 16 USPQ2d 1430 (Fed. Cir. 1990) (emphasis in original). Thus, it is respectfully submitted that the standard set forth in the Official Action is improper to support a finding of *prima facie* obviousness.

The Official Action asserts that Kensaku discloses “irradiating the semiconductor film with an excimer laser ... while applying ultrasonic vibration to the substrate to crystallize the semiconductor film” (pages 2-3, Paper No. 20060929). The Official Action concedes that Kensaku does not teach “floating the substrate, holding the substrate using a chuck, applying the ultrasonic vibration to the substrate through the chuck, and wherein the substrate is floated by the chuck holding the end portion” (page 3, Id.). The Official Action relies on Tanaka to allegedly teach “holding a substrate over a single stage having pores, spouting gases from the pores to float the substrate, and holding an end portion of the substrate” (Id.). Without any specific references to Kensaku or Tanaka in support or statements which establish the level of ordinary skill in the art at the time of the present invention, the Official Action asserts that “it would have been obvious ... to hold the substrate as disclosed by Tanaka et al. because such a method allows for adequate controlled crystallization of the semiconductor film” (Id.). The Applicant respectfully disagrees and traverses the above assertions in the Official Action.

Although the purpose of floating the substrate of the present invention is to propagate the ultrasonic vibration to the substrate efficiently, both Kensaku and Tanaka do not recognize problems with efficient propagation of ultrasonic vibration because of a curve on the substrate and do not disclose or suggest that the substrate is floated so as to propagate the ultrasonic vibration to it efficiently. Tanaka appears to disclose that the substrate is floated in order to move the substrate and, as conceded by the Official Action, Kensaku does not disclose floating the substrate. The Applicant further notes that Kensaku does not teach or suggest applying ultrasonic vibration to the substrate and floating a substrate while irradiating a laser beam. Tanaka does not teach or suggest that ultrasonic vibration should be applied while floating the substrate, and the Official Action has not demonstrated why one of ordinary skill in the art at the time of the present invention would have been motivated to float the substrate in Kensaku while applying ultrasonic vibration.

The Official Action asserts that "Tanabe discloses a substrate being held on a substrate holding unit by means of a chuck" and that "Akram et al. discloses imparting ultrasonic vibration to a substrate by running the vibration through the chuck" (page 3, Paper No. 20060929). Without any specific references to Kensaku, Tanaka, Tanabe or Akram in support or statements which establish the level of ordinary skill in the art at the time of the present invention, the Official Action further asserts that "it would have been obvious ... to modify the process of Kensaku modified by Tanaka et al. and Tanabe so as to run the ultrasonic vibration through the chuck because Akram et al. shows that such a method is a suitable way in which an ultrasonic vibration can be applied to a substrate" (pages 3-4, Id.). The Applicant respectfully disagrees and traverses the above assertions in the Official Action.

Akram appears to teach that chuck 122 is attached to a semiconductor substrate bottom surface 106 by using a vacuum force (Figure 2 reproduced below).

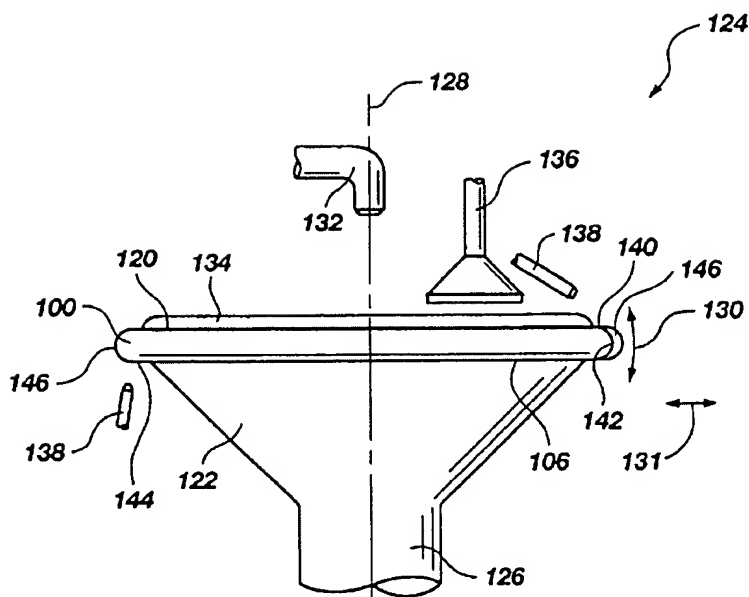


Fig. 2

However, Akram does not teach or suggest that chuck 122 is attached to the end portion of a substrate. Thus, even if one were motivated to apply Akram to the alleged combined device of Kensaku, Tanaka and Tanabe, one would not be motivated to apply chuck 122 to the end portion of a substrate. Further, chuck 122 of Akram appears to be used for coating a layer of dielectric and does not appear to be related to irradiating a laser or floating a substrate. The Official Action has not presented sufficient evidence to explain why one of ordinary skill in the art would have been motivated to use chuck 122 of Akram in a process for irradiating a laser or while floating a substrate.

Even assuming motivation could be found, the Official Action has not given any indication that one with ordinary skill in the art at the time of the invention would have had a reasonable expectation of success when combining Kensaku, Tanaka, Tanabe and Akram. Akram is directed to vibration-enhanced spin-on film techniques. There is no discussion in the Official Action as to why one of skill in the art would have expected that the use of Akram's chuck for such vibration-enhanced spin-on film techniques

would be successful while irradiating a laser beam and floating a substrate with the chuck holding an end portion of the substrate during the irradiation.

Chae, Liu and Kusumoto do not cure the deficiencies in the motivation to combine Kensaku and Tanaka or to combine Kensaku, Tanaka, Tanabe and Akram. The Official Action relies on Chae to allegedly teach overlapping a beam of spot lasers (page 4, Paper No.20060929), on Liu to allegedly teach adding a metal element for enhancing crystallization (page 5, Id.), and on Kusumoto to allegedly teach laser annealing in an oxygen atmosphere (page 6, Id.). However, Kensaku, Tanaka, Tanabe, Akram, Chae, Liu and Kusumoto, either alone or in combination do not teach or suggest why one of ordinary skill in the art at the time of the present invention would have been motivated to float the substrate in Kensaku while applying ultrasonic vibration; or why one of ordinary skill in the art would have been motivated to use chuck 122 of Akram in a process for irradiating a laser or while floating a substrate.

Therefore, the Applicant respectfully submits that the Official Action has not provided a proper or sufficient suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify Kensaku, Tanaka, Tanabe, Akram, Chae, Liu and Kusumoto or to combine reference teachings to achieve the claimed invention.

In the present application, it is respectfully submitted that the prior art of record, either alone or in combination, does not expressly or impliedly suggest the claimed invention and the Official Action has not presented a convincing line of reasoning as to why the artisan would have found the claimed invention to have been obvious in light of the teachings of the references.


For the reasons stated above, the Official Action has not formed a proper *prima facie* case of obviousness. Accordingly, reconsideration and withdrawal of the rejections under 35 U.S.C. § 103(a) are in order and respectfully requested.

New dependent claims 26-32 have been added to recite additional protection to which the Applicant is entitled. The features of claims 26-32 are supported by the

present specification, for example, at page 10, lines 19-23 and Figure 1. For the reasons stated above and already of record, the Applicant respectfully submits that new claims 26-32 are in condition for allowance.

Should the Examiner believe that anything further would be desirable to place this application in better condition for allowance, the Examiner is invited to contact the undersigned at the telephone number listed below.

Respectfully submitted,



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